

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 25 JUL 2005

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Applicant's or agent's file reference RSJ08428WO	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/GB2004/001615	International filing date (day/month/year) 14.04.2004	Priority date (day/month/year) 17.04.2003	
International Patent Classification (IPC) or national classification and IPC G01N27/00, H03L5/02			
Applicant AKUBIO LIMITED et al.			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

- sent to the applicant and to the International Bureau a total of sheets, as follows:
 - sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
- (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)), containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

Date of submission of the demand 16.11.2004	Date of completion of this report 26.07.2005
Name and mailing address of the International preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Duchatellier, M Telephone No. +31 70 340-2272



**INTERNATIONAL PRELIMINARY REPORT
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Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
 - international search (under Rules 12.3 and 23.1(b))
 - publication of the international application (under Rule 12.4)
 - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-11 as originally filed

Claims, Numbers

1-18 as originally filed

Drawings, Sheets

1/3-3/3 as originally filed

a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. The amendments have resulted in the cancellation of:
 - the description, pages
 - the claims, Nos.
 - the drawings, sheets/figs
 - the sequence listing (*specify*):
 - any table(s) related to sequence listing (*specify*):
4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - the description, pages
 - the claims, Nos.
 - the drawings, sheets/figs
 - the sequence listing (*specify*):
 - any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-18
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-18
Industrial applicability (IA)	Yes:	Claims	1-18
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

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Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- 1). Reference is made to the following documents:

D1:US-A-6041642

D2:US-A-4818954

D3:WO-A-0102857

- 2). One could argue that D1 and D2 relate to distinct areas of technology because they have different international classification codes (in this case G01N27/00 and A61B17/36) and, consequently, that they cannot be combined.

The examiner does not agree with this opinion for the following reasons:

a). the application itself is not limited to a particular area of technology (cf. page 1, lines 1,2: "This invention relates to a crystal oscillator circuit **for example**, for use in sensors" or page 1, lines 33, 34: "**For example**, the quartz crystal may be used as a motional transducer"). More particularly, **claim 1** refers only to "an apparatus for oscillating a surface", such an apparatus can be found in many areas of technology.

In fact, the invention relate to applications of quartz crystals where the driving power is required to be varied over a wide range (cf. description page 1, lines 29-31). Such applications can be found in many areas of technology, as the use of quartz crystals is very common. Thus it is logical, for the skilled man, to search in all areas of technology where such applications can be found and to combine eventually documents relating to the use of quartz crystals.

b). In this particular case the classification A61B relates to medical diagnosis, and in the IPC there is (in the class A61B) a reference to the analysis of biological material (G01N for example G01N33/48). So, it is well known that the difference between these two classes is not always obvious.

Here are some examples:

- G01N27/447 relates to electrophoresis, which is often used for medical diagnosis.
 - A61B6/00 relates to "apparatus for radiation diagnosis", this can be done by X-ray tomography (G01N23) or by ultra-sound tomography (G01N29).
 - The analysis of blood can be done "in vivo" (A61B5/14) or "in vitro" (G01N33/48).
- Consequently, A61B and G01N are not very distinct areas of technology.**

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3). The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.

Document D1 is regarded as being the closest prior art to the subject-matter of claim 1 and discloses (the references in parentheses applying to this document):

An apparatus for oscillating a surface (cf. claim 1), the apparatus comprising an oscillator circuit having:

- a) a piezoelectric crystal connected to the surface (cf. claim 3);
- b) a variable frequency generator for generating a driving signal which is supplied to the crystal to cause the crystal to oscillate (cf. figure 1); and

c) an analyser for monitoring the phase shift between the voltage across the crystal and the displacement of the surface (cf. column 3, line 63-column 4, line 11) and, in response, generating an adjustment signal which relates to the difference between the oscillation frequency and a resonant frequency of the crystal, the variable frequency generator being responsive to the adjustment signal to vary the frequency of the driving signal to cause the crystal to oscillate at the resonant frequency (cf. claim 1).

The subject-matter of claim 1 therefore differs from this known from D1 in that: the analyser monitors the phase shift between the voltage across the crystal and the current flowing through it.

Document D2 discloses an oscillator circuit wherein the phase shift between the voltage across the load and the current flowing through it is maintained to zero for operating on a real load (cf. column 4, lines 5-23).

Consequently, the skilled man having in mind the state of the art as disclosed in D1 would require no effort of inventive significance to use the phase shift between the voltage and the current to cause a crystal to oscillate at the resonant frequency.

4). Independent claims 10,17,18

The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claims 10, 17, 18 which therefore are also considered not inventive.

5). Dependent apparatus-claims 2-9.

Dependent claims 2-9 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step:

5.1 Claim 2: known from D1, as A VCO normally comprises a frequency synthesizer.

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5.2 Claim 3: it is well known that the oscillation frequency of a quartz crystal is temperature dependent.

5.3 Claim 4: known from D1: see figure 1.

5.4 Claims 5,6: the generation of a quadrature signal is suggested by D3 (which was cited by the applicant as illustrating the state of the art), cf. page 8, line 1.

5.5 Claims 7,8: known from D1 (see figure 1).

5.6 Claim 9: the use of a voltage controlled amplifier does not seem inventive.

6). Dependent method-claims 10-16

Dependent claims 10-16 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step:

6.1 Claims 10-16: for similar reasons as put forward concerning dependent apparatus-claims 2-9, the subject-matter of dependent method-claims 10-16 cannot be considered as inventive.

7). Independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT.

8). The features of the preamble of claim 1 are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

9). Although claims 1, 10, 17 and 18 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.